



# Technology and Learning Connections

*Increasing student achievement through the systemic alignment of technology, policies, and curriculum in a multi-tiered system of supports.*



## Big Idea

When we talk about “academic problem solving” we are talking about analyzing students’ learning needs in relation to a standard or set of standards (core instruction) and using that information to increase the effectiveness of all Tiers of instruction.

## Academic Problem Solving

- Analysis of high probability barriers
- Analysis of instructional materials
- Exploration of instructional scaffolds
- Closer analysis of the standard
- Analysis of individual student responses
- Increased time with student
- Increased frequency of formative assessments
- Increased frequency of adjustments to instruction
- Review of instructional alignment within the Tiers
- Generalization of supports between the Tiers



*Actively processing information and experiences in a way that results in a measurable increase of knowledge directly related to a standard or set of standards.*

## Goals & Objectives

- Describe a continuum of supports that address barriers to engagement
- Identify barriers to designing effective instruction for all students
- List critical aspects of an infrastructure necessary to support a highly effective core curriculum for all students
- Describe how to match instructional scaffolding to student needs
- Identify technology tools and resources to support effective instructional strategies
- Describe how to align and problem solve within all tiers of instruction.



*A Multi-Tiered  
System of Supports*



## Standards

Unpacking Steps (this information should come from core)	Example pre-requisite or implied skills
<ul style="list-style-type: none"> <li>• Select a standard or set of standards</li> <li>• Circle the verbs and action phrases (skills-Do)</li> <li>• Underline the nouns and noun phrases (knowledge and understanding—K and U)</li> <li>• Identify pre-requisite skills implied within the standard</li> <li>• Determine instructional implications of the standard</li> </ul>	<p>Reading   Planning and Problem Solving   Critical Thinking Skills   Maintain Focus   Task Persistence   Organization and Synthesis of Information   Self-Regulation   Active Listening</p> <p>Instructional Implication</p> <ul style="list-style-type: none"> <li>• Review/reteach the implied pre-requisite skills</li> <li>• Provide scaffolding for implied pre-requisite skills</li> </ul>

## Instructional Indicators (Hattie)

Direct Instruction	Gaining Meaning	Relevance
<ul style="list-style-type: none"> <li>• Clear learning goals/intentions</li> <li>• Clear success criteria</li> <li>• Build engagement</li> <li>• Appropriate lesson presentation</li> <li>• Guided practice</li> <li>• Closure &amp; independent practice</li> </ul>	<ul style="list-style-type: none"> <li>• Summarizing</li> <li>• Questioning</li> <li>• Clarifying</li> <li>• Predicting</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge integration</li> <li>• Background knowledge</li> <li>• Connectedness to the student's world</li> <li>• Problem-based instruction</li> </ul>

## Student Characteristics (Hattie)

<ul style="list-style-type: none"> <li>• Self-efficacy   the confidence that we can learn</li> <li>• Self-handicapping   choosing obstacles to avoid failure</li> <li>• Self-motivation   ratio of intrinsic and extrinsic motivation</li> <li>• Self-goals   master, performance, and social goals</li> </ul>	<ul style="list-style-type: none"> <li>• Self-dependence   being dependent on adults for directions, goals, help, etc.</li> <li>• Self-discounting   believing positive feedback is invalid</li> <li>• Hopelessness   feeling like there is no point in trying, that failure is inevitable</li> <li>• Social comparison   self-image is based on a comparison with others</li> </ul>
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## Cognitive Processes

### Input

- Recognizing size, shape, and placement of text
- Recognizing line and paragraph typography
- Distinguishing subtle differences in sounds

### Integration

- Sequencing (ordering, sequencing, and organizing information)
- Abstraction (inferring meaning and generalizing a text)

### Memory

- Short & long term memory
- Long term potentiation
- Long term depression

### Output

- Spontaneous language
- Demand language

## Engagement

### Academic Engagement “I can”

- Grade level reading, writing, math, and science skills
- Digital citizenship
- Global/cultural awareness
- Research/information literacy
- Effective use of real-world tools
- STEM

### Social Engagement “I belong”

- Perspective taking
- Appreciating diversity
- Interactive communication
- Cooperation
- Conflict resolution
- Seeking and providing help

### Psychological Engagement “I want to”

- Self-confidence
- Self-efficacy
- Impulse control
- Stress management
- Self-discipline
- Organization
- Planning and problem solving
- Progress monitoring

## Universal Design for Learning (UDL)

### UDL Principles

#### • Flexibility in Representation

- Options for perception
- Options for language and symbols
- Options for comprehension

#### • Flexibility in Expression

- Options for physical action
- Options for expressive skills/fluency
- Options for executive functions

#### • Flexibility in Engagement

- Options for recruiting interest
- Options for sustaining effort
- Options for self-regulation



**Recognition** Networks—how we recognize information and categorize what we see, hear, and read.



**Strategic** Networks—how we organize and express our ideas; plan and perform tasks.



**Affective** Networks—how we are challenged, excited, or interested.



### Infrastructure/Making Systemic Connections | Questions to ask.

- Do your grade level or subject level teachers currently plan instruction together?
- Do your grade level or subject level teachers currently problem solve instruction together?
- Do you have an inventory of all the instructional and technology resources available in your school/district?
- Are your teachers aware of all the instructional and technology resources available in your school/district?
- Are your teachers aware of all the features of their technology/resources and can they use them for instruction and intensive intervention?

Example: If a classroom has an interactive whiteboard does the teacher understand and know how to use all of the features of that resource? Can the teacher select the appropriate features to support memory or information organization?

- Does your district's textbook and instructional materials guidelines ensure that flexible digital formats are being purchased to support Universal Design for Learning and the use of instructional scaffolds to support intensive intervention?
- Does your district's IT department have a set of guidelines that support teachers being able to quickly try out different types of software or technologies when problem solving intensive intervention?

## Technology Resources



Assistive Technology  
Gallery - A collection of  
images of technologies  
for students.  
<http://bit.ly/1TqnYjj>



National Accessible  
Educational Materials  
Center - Resources on  
accessible instruction.  
<http://aem.cast.org/>



Assistive Technology  
Brochure - Information  
on assistive technology  
for students.  
<http://bit.ly/11ujaU6>



Digital Materials  
Accessibility Discussion  
Guide  
<http://bit.ly/1b4YJM2>

